



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/811,356	03/25/2004	Oliver P. Sohm	TI-35856	2074
23494	7590	11/14/2007	EXAMINER	
TEXAS INSTRUMENTS INCORPORATED P O BOX 655474, M/S 3999 DALLAS, TX 75265			YAARY, MICHAEL D	
ART UNIT		PAPER NUMBER		
2193				
NOTIFICATION DATE		DELIVERY MODE		
11/14/2007		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspto@ti.com
uspto@dlemail.itg.ti.com

Office Action Summary	Application No.	Applicant(s)
	10/811,356	SOHM, OLIVER P.
	Examiner	Art Unit
	Michael Yaary	2193

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 06 September 2007.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1,3,4,6-9 and 11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) 6-9 and 11 is/are allowed.
- 6) Claim(s) 1,3 and 4 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application
- 6) Other: _____.

DETAILED ACTION

1. Claims 1, 3, 4, 6-9, and 11 are pending in the application.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 3, and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wadleigh (US Pat. 6,088,714) in view of Sayegh (US Pat. 5,293,330) and further in view of Horton (US Pat. 6,421,696).
4. Wadleigh and Sayegh were cited in the previous office action dated 06/06/2007.

5. **As to claim 1**, Wadleigh discloses a method of performing a Fast Fourier Transform in a data processing apparatus having data cache smaller than the data set of the Fast Fourier Transform (column 2, lines 38-41), comprising the steps of:

Dividing said input data in R continuous data sets where each of said R continuous data sets fit within the data cache (Column 4, lines 29-61 disclose how in a

system when the data exceeds cache size, the cache utilizing different arrays to store the data).

6. Wadleigh does not disclose separately and independently performing a first stage radix-R butterfly computations on all the R continuous data sets thereby producing R independent intermediate data sets each of which fits within the data cache; and successively performing second and all subsequent stage butterfly computations on each independent intermediate data set in turn producing corresponding output data.

However, Sayegh discloses separately and independently performing a first stage radix-R butterfly computations on all the R continuous data sets thereby producing R independent intermediate data sets each of which fits within the data cache (Abstract, lines 1-22 and column 4, lines 1-24); and successively performing second and all subsequent stage butterfly computations on each independent intermediate data set in turn producing corresponding output data (column 2, line 54-column 3, line 7 and column 6, lines 16-22).

7. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Wadleigh by performing first stage radix-R butterfly computations and second and subsequent butterfly computations, as taught by Sayegh, in order to achieve real-time high speed processing.

8. The combination of Wadleigh and Sayegh disclose disposing said input data into memory (Wadleigh column 4, lines 29-61) but the combination of Wadleigh and Sayegh do not disclose each R continuous data set in continuous memory locations with a space in memory locations from an end of one continuous data set to a beginning of a next continuous data set equal to the size of a cache line.

9. However, in an analogous art Horton discloses each R continuous data set in continuous memory locations with a space in memory locations from an end of one continuous data set to a beginning of a next continuous data set equal to the size of a cache line (Column 13, lines 34-63 disclose in a Fast Fourier Transform processor system, utilizing spaces in a cache. Specifically displacing locations in a cache line by inserting instructions to separate data. Subsequent data is thus displaced to the next cache line. This spacing technique, or an analogous one, can be utilized in the system of Wadleigh and Sayegh to achieve the predictable result of minimizing cache misses.).

10. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Wadleigh and Sayegh, by utilizing spacing in the cache lines, as taught by Horton, for the benefit of reducing cache misses and minimizing stalls in a Fast Fourier Transform processor system.

11. **As to claims 3 and 4**, the combination of Wadleigh, Sayegh, and Horton further disclose said radix-R is radix-2 and radix-4 (Sayegh, abstract lines 19-20).

Allowable Subject Matter

12. Claims 6-9 and 11 are allowed.

Response to Arguments

13. Applicant's arguments with respect to claims 1, 3, 4, 6-9, and 11 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a):

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Yaary whose telephone number is (571) 270-1249. The examiner can normally be reached on Monday-Friday, 8:00 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MY

MY


MENG-AL T. AN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100